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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/658,252	09/09/2003	Akihiro Maezawa	KON-1823	4122
20311	7590	07/03/2006	EXAMINER	
LUCAS & MERCANTI, LLP 475 PARK AVENUE SOUTH 15TH FLOOR NEW YORK, NY 10016			LEE, SHUN K	
			ART UNIT	PAPER NUMBER
			2884	

DATE MAILED: 07/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/658,252

Applicant(s)

MAEZAWA ET AL.

Examiner

Shun Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01/04/06, 1/25/06, and 04/19/06.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-18 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 04 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 20060104, 20060125.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement filed 25 January 2006 fails to comply with 37 CFR 1.97(c) because it lacks the fee set forth in 37 CFR 1.17(p). It has been placed in the application file, but the information referred to therein has not been considered.

### ***Drawings***

2. The drawings were received on 4 January 2006. These drawings are acceptable.

### ***Specification***

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Objections***

4. Claim 5 is objected to because of the following informalities: “;,” on line 7 in claim 5 should probably be --;--. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-9 and 11-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimada *et al.* (US 5,028,509) in view of Riman *et al.* (US 6,699,406) and Hampden-Smith *et al.* (US 6,210,604).

The specification discloses (pg. 13, lines 14-16) that "The term "spherical particles" here means particles which have a ratio of the long to the short dimensions being 0.95-1.05, employing an SEM observation method".

In regard to claims 1, 5, and 7, Shimada *et al.* disclose a radiation image converting panel (column 11, line 60 to column 12, line 2) comprising a support having thereon a stimuable phosphor layer containing a polymer and a stimuable phosphor (column 4, line 53 to column 5, line 22) represented by Formula (1):

$M^1X \cdot aM^2X' \cdot bM^3X'' : eA$  wherein  $M^1$  is at least one alkaline metal atom selected from the group consisting of Li, Na, K, Rb, and Cs;  $M^2$  is at least one divalent metal atom selected from the group consisting of Be, Mg, Ca, Sr, Ba, Zn, Cd, Cu, and Ni;  $M^3$  is at least one trivalent metal atom selected from the group consisting of Sc, Y, La, Ce, Pr,

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Nd, Pm, Sm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Al, Ga and In; X, X', and X'' each represents at least one halogen atom selected from the group consisting of F, Cl, Br, and I; A represents at least one metal atom selected from the group consisting of Eu, Tb, In, Ce, Tm, Dy, Pr, Ho, Nd, Yb, Er, Gd, Lu, Sm, Y, Tl, Na, Ag, Cu, and Mg; and a, b, and e each are numbers satisfying the conditions of  $0 \leq a < 0.5$ ,  $0 \leq b < 0.5$ , and  $0 < e \leq 0.2$ , the stimuable phosphor layer having a thickness of 50  $\mu\text{m}$  to 1 mm (column 13, lines 16-22). The method of Shimada *et al.* lacks that the stimuable phosphor has a spherical shape produced by the steps of: (i) forming a CsBr:Eu precursor with an emulsified layer method by mixing: (a) an aqueous solution containing Cs ions, Br ions and Eu ions; (b) an organic solvent having a different solubility for the Cs ions, the Br ions and the Eu ions; and (c) a surface active agent; (ii) isolating the CsBr:Eu precursor; and (iii) burning the CsBr:Eu precursor to obtain the stimuable phosphor. Hampden-Smith *et al.* teach (column 1, lines 20-42) to provide uniform high purity spherical phosphor particles having high crystallinity, in order to obtain high luminescent intensity and long lifetime. Further, Riman *et al.* teach (column 5, lines 28-67) to precipitate particles from an aqueous solution of constituent ions with a polar organic solvent, in order to obtain high quality optical materials with luminescent properties and (column 4, lines 58-67) to sublime participated particles in order to obtain high purity by removing undesired compounds. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to sublime a CsBr:Eu precursor precipitated from an aqueous solution of constituent ions (*e.g.*, Cs ions, Br ions and Eu ions) with an organic solvent and a surface active agent in the method of Shimada *et al.*, in order to

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remove undesired compounds and obtain uniform high purity spherical phosphor particles so as to achieve high luminescent intensity and long lifetime.

In regard to claims **8**, **11** and **15**, Shimada *et al.* disclose a radiation image converting panel (column 11, line 60 to column 12, line 2) comprising a support having thereon a stimuable phosphor layer containing a polymer and a stimuable phosphor (column 4, line 53 to column 5, line 22) represented by Formula (1):

$M^1X \cdot aM^2X' \cdot bM^3X'' : eA$  wherein  $M^1$  is at least one alkaline metal atom selected from the group consisting of Li, Na, K, Rb, and Cs;  $M^2$  is at least one divalent metal atom selected from the group consisting of Be, Mg, Ca, Sr, Ba, Zn, Cd, Cu, and Ni;  $M^3$  is at least one trivalent metal atom selected from the group consisting of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Al, Ga and In; X, X', and X'' each represents at least one halogen atom selected from the group consisting of F, Cl, Br, and I; A represents at least one metal atom selected from the group consisting of Eu, Tb, In, Ce, Tm, Dy, Pr, Ho, Nd, Yb, Er, Gd, Lu, Sm, Y, Tl, Na, Ag, Cu, and Mg; and a, b, and e each are numbers satisfying the conditions of  $0 \leq a < 0.5$ ,  $0 \leq b < 0.5$ , and  $0 < e \leq 0.2$ , the stimuable phosphor layer having a thickness of 50  $\mu\text{m}$  to 1 mm (column 13, lines 16-22). The method of Shimada *et al.* lacks that the stimuable phosphor has a spherical shape produced by the steps of: (i) forming an aqueous phase containing Cs ions, Br ions and Eu ions; (ii) adding an organic phase containing an organic solvent and an surface active agent to the aqueous phase so as to obtain a CsBr:Eu precursor; and (iii) isolating the CsBr:Eu precursor; and (iv) burning the CsBr:Eu precursor to obtain the stimuable phosphor. Hampden-Smith *et al.* teach (column 1, lines 20-42) to

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provide uniform high purity spherical phosphor particles having high crystallinity, in order to obtain high luminescent intensity and long lifetime. Further, Riman *et al.* teach (column 5, lines 28-67) to precipitate particles from an aqueous solution of constituent ions with a polar organic solvent, in order to obtain high quality optical materials with luminescent properties and (column 4, lines 58-67) to sublimate participated particles in order to obtain high purity by removing undesired compounds. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to sublimate a CsBr:Eu precursor precipitated from an aqueous solution of constituent ions (e.g., Cs ions, Br ions and Eu ions) with an organic solvent and a surface active agent in the method of Shimada *et al.*, in order to remove undesired compounds and obtain uniform high purity spherical phosphor particles so as to achieve high luminescent intensity and long lifetime.

In regard to claim **2** (which is dependent on claim 1) and claim **12** (which is dependent on claim 11), Shimada *et al.* also disclose (column 11, lines 52-59) that the stimuable phosphor has an average particle diameter of 0.1 to 5  $\mu\text{m}$ .

In regard to claim **3** (which is dependent on claim 1) and claim **13** (which is dependent on claim 11), Shimada *et al.* also disclose (column 4, line 53 to column 5, line 22) that the stimuable phosphor layer comprises Cs atom in an amount of not less than 10% based on the total weight of the layer.

In regard to claim **4** (which is dependent on claim 1) and claim **14** (which is dependent on claim 11), Shimada *et al.* also disclose (column 4, line 53 to column 5, line 22) that the stimuable phosphor layer comprises: (i) CsBr; and (ii) Eu and an

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impurity, an amount of Eu and the impurity being 100 to 1000 ppm by weight based on the total weight of CsBr.

In regard to claim **6** (which is dependent on claim 1) and claim **16** (which is dependent on claim 11), the panel of Shimada *et al.* lacks that the stimuable phosphor has a peak at (2,0,2) as a maximum peak measured with X-ray diffraction. Hampden-Smith *et al.* teach (column 1, lines 20-42) to provide uniform high purity spherical phosphor particles having high crystallinity, in order to obtain high luminescent intensity and long lifetime. Hampden-Smith *et al.* also teach (column 39, lines 51-56) that crystallinity is determined by X-ray diffraction. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a high crystallinity stimuable phosphor (with e.g., a (2,0,2) X-ray diffraction maximum peak) in the panel of Shimada *et al.*, in order to obtain high luminescent intensity and long lifetime.

In regard to claim **9** (which is dependent on claim 7) and claim **17** (which is dependent on claim 8), Shimada *et al.* also disclose (column 11, lines 9-46) a step of heating the stimuable phosphor between 400 to 700°C under an atmospheric pressure.

8. Claims 10 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimada *et al.* (US 5,028,509) in view of Riman *et al.* (US 6,699,406), Hampden-Smith *et al.* (US 6,210,604), and Takahashi *et al.* (US 4,926,047).

In regard to claim **10** (which is dependent on claim 7) and claim **18** (which is dependent on claim 7), Shimada *et al.* in view of Riman *et al.* and Hampden-Smith *et al.* is applied as in claims 1, 5, 7, 8, 11, and 15 above. Shimada *et al.* also disclose



(column 11, line 60 to column 12, line 2) the steps of: (i) mixing a stimuable phosphor and a polymer to obtain a coating mixture; and (ii) coating the coating mixture on a support to obtain a coated layer (column 11, line 60 to column 12, line 2). The method of Shimada *et al.* lacks heating the coated layer under an inactive gas atmosphere so as to dry the coated layer. Takahashi *et al.* teach (column 7, lines 39-42) to heat the coated layer, in order to complete the formation of the phosphor layer. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to heat the coated layer (*e.g.*, under an inactive gas atmosphere) in the method of Shimada *et al.*, in order to complete the formation of the phosphor layer.

### ***Response to Arguments***

9. Applicant's arguments filed 4 January 2006 have been fully considered but they are not persuasive.

Applicant argues (first three paragraphs on pg. 21 of remarks filed 4 January 2006) that Riman *et al.* do not employ a surface active agent. Examiner respectfully disagrees. Riman *et al.* state (column 5, lines 50-53) that " ... precipitation is obtained by adding a polar organic solvent such as ethanol ... ". Ethanol is a known surface active agent (*i.e.*, surfactant; *e.g.*, see Xie *et al.* or Gilton). Therefore, Riman *et al.* do employ a surface active agent.

Applicant argues (last paragraph on pg. 21 to first paragraph on pg. 23 of remarks filed 4 January 2006) that Riman and the remaining cited references do not teach or suggest producing the phosphor using a surface active agent and that Table I of the application demonstrates the criticality of producing the stimuable phosphor

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using an organic solvent and a surface active agent. Examiner respectfully disagrees.

The evidence relied upon should establish that the differences in results are in fact unexpected and unobvious and of both statistical and practical significance

(MPEP § 716.02). First it is noted that Table I does not provide any statistical analysis of the data summary presented. Thus Table I does not appear to establish the statistical and practical significance of the difference among samples I1, I2, ..., and I9.

Further it is noted that sample I9 was not produced by a method which uses an organic solvent (Table I). It is unclear from the specification how the spherical CsBr particles were deposited to obtain a CsBr: Eu phosphor precursor to produce sample I9. Thus even if the difference among samples were established as being of statistical and practical significance, it is unclear whether the difference is due to only the organic solvent, only the surface active agent, or both the organic solvent and the surface active agent from Table I. Therefore, applicant's arguments are not persuasive.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent 5,531,880 (Xie *et al.*) discloses (column 6, lines 38-41) a surfactant is methanol, ethanol, IPA, or any of a number of commercially available surfactants. US Patent 5,981,303 (Gilton) discloses (column 3, lines 18-22) a surfactant is an alcohol such as commercially available isopropyl alcohol, ethanol, or 2-butanol.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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